

CHAPTER 10

SITE LIGHTING REQUIREMENTS

A. **Intent and Purpose**

It is the intent of this Chapter to encourage lighting practices and systems that will minimize light pollution, glare, light trespass; conserve energy and resources while maintaining night-time safety, utility, security and productivity; and curtail the degradation of the night time visual environment. The purpose of this section is to establish regulations to allow for outdoor illumination levels that are appropriate for the visual task, safety and security while minimizing the undesirable side effects of excessive illumination such as glare, sky glow and light pollution. Over time, it is the intent that this section will allow for reasonably uniform illumination levels in the community. It is also the purpose of this section to establish design criteria for outdoor lighting fixtures that will enhance the visual and aesthetic character of the City of Lakeland.

B. **Applicability**

1. *New Uses* – All proposed new land uses, developments, buildings, structures, or building additions of twenty-five percent (25%) or more in terms of additional dwelling units, gross floor area, seating capacity, or other units of measurement specified herein, either with a single addition or cumulative additions subsequent to the effective date of this provision, shall meet the requirements of this Chapter for the entire property. This includes additions which increase the total number of required parking spaces by twenty-five percent (25%) or more. For all building additions of less than twenty-five percent (25%) cumulative, the applicant shall only have to meet the requirements of this Chapter for any new outdoor lighting provided.
2. *Change in Use/Intensity* – Except as provided in Subsection 3 below, whenever the use of any existing building, structure, premises is changed to a new use, or the intensity of use is increased through the incorporation of additional dwelling units, gross floor area, seating capacity, or other units of measurement specified herein, and which change in use or intensification of use creates a need for increase in the total number of required parking spaces of twenty-five percent (25%) or more, either with a single change or cumulative changes subsequent to the effective date of these provisions, then all outdoor lighting facilities shall meet the requirements of this Chapter for the entire property, to the maximum extent possible as determined by the Design Review Commission. For changes of use or intensity which require an increase in parking of less than twenty-five percent (25%) cumulative, the applicant shall only have to meet the requirements of this Chapter for any new outdoor lighting provided.
3. *Nonconforming Uses, Structures or Lots* – Whenever a nonconforming use, structure or lot is abandoned for a period of ninety (90) consecutive days and then changed to a new use, then any existing outdoor lighting shall be reviewed and brought into compliance as necessary for the entire building,

structure or premises, to the maximum extent possible as determined by the Design Review Commission.

No outdoor lighting fixture which was lawfully installed prior to enactment of this Ordinance shall be required to be removed or modified except as expressly provided herein; provided, however, no modification or replacement shall be made to a nonconforming fixture unless the fixture thereafter conforms to the provisions of this Chapter.

In the event that any nonconforming sign, as to lighting, is abandoned or is damaged, and the damage exceeds fifty percent (50%) of the replacement value, exclusive of foundations, to replace it, the sign shall be brought into conformance with the provisions of this Chapter with respect to lighting as well as applicable provisions of the Sign Ordinance.

C. Definitions

The following words and terms related to outdoor lighting are defined as follows:

1. *Direct Illumination* – Illumination resulting from light emitted directly from a lamp, luminary, or reflector and is not light diffused through translucent signs or reflected from other surfaces such as the ground or building faces.
2. *Foot Candle* – A unit of measure for luminance. A unit of luminance on a surface that is everywhere one foot from a uniform point source of light of one candle and equal to one lumen per square foot.
3. *Full Cut-Off Type Fixture* – A luminaire or light fixture that by design of the housing does not allow any light dispersion or direct glare to shine above ninety 90 degrees, horizontal plane from the base of the fixture.
4. *Fully-shielded Light Fixture* – A light fixture that is shielded in such a manner that light rays emitted by the fixture, either directly from the lamp or indirectly from the fixture, are projected below a horizontal plane running through the lowest point on the fixture where light is emitted.
5. *Glare* – The sensation produced by lighting that causes an annoyance, loss in visual performance and visibility to the eye. The magnitude of glare depends on such factors as the size, position, brightness of the source, and on the brightness level to which the eyes are adapted.
6. *Horizontal Luminance* – The measure of brightness from a light source, usually measured in foot candles or lumens, which is taken through a light meter's sensor at a horizontal position.
7. *Illuminance* – The quantity of light measured in foot candles or lux.
8. *Light Trespass* – Light from an artificial light source that is intruding beyond the boundaries of the property upon which the lighting is intended to serve.
9. *Lumen* – Unit used to measure the actual amount of visible light which is produced by a lamp as specified by the manufacturer.
10. *Luminaire* – A complete lighting unit, including a lamp or lamps together with the parts designed to distribute the light, to position and protect the lamps, and to connect the lamps to the power supply.

11. *Luminance* – The physical and measurable quantity corresponding to the type of surface (e.g., a lamp, luminaires, reflecting material) in a specific area, with a luminance meter.
12. *Motion-sensing Security Lighting* – Any fixture designed, and properly adjusted, to illuminate an area around a residence or other building by means of switching on a lamp when motion is detected inside the area or perimeter, and switching the lamp off when the detected motion ceases.
13. *Lux* – A unit of light intensity stated in lumens per square meter. There are approximately 10.7 lux per foot candle.
14. *Opaque* – A material that does not permit light transmittal from an internal illumination source.
15. *Outdoor Lighting Fixture* – An outdoor illuminating device, outdoor lighting or reflective surface, lamp or similar device, permanently installed or portable, used for illumination, decoration, or advertisement. Such devices shall include, but are not limited to lights used for:
 - a. buildings and structures;
 - b. recreational areas;
 - c. parking lot lighting;
 - d. landscape lighting;
 - e. architectural lighting;
 - f. signs;
 - g. street lighting;
 - h. product display area lighting;
 - i. building overhangs and open canopies; and
 - j. security lighting
16. *Outdoor Recreation Facility* – an area designed for active recreation, whether publicly or privately owned, including, but not limited to, parks, baseball fields, softball fields, soccer fields, football fields, golf courses and driving ranges, tennis courts, and swimming pools.
17. *Semi Cut-off Light Fixture* – A luminaire that allows no more than six (6) percent of the light from the lamp to be emitted above a horizontal plane passing through the luminaire's lowest light-emitting part.
18. *Security Light* – Lighting designed to illuminate a property or grounds for the purpose of visual security. This includes fully shielded lighting fixtures.
19. *Unshielded Light Fixture* – Any fixture that allows light to be emitted above the horizontal directly from the lamp or indirectly from the fixture or reflector.
20. *Uplighting* – Any light source that distributes illumination above ninety (90) degree horizontal plane.
21. *Uniformity Ratio* – Describes the average level of illumination in relation to the lowest level of illumination for a given area. For example, a Uniformity Ratio of 4:1 for a given area means the lowest level of illumination (1) should be no less than twenty-five percent (25%) or “four (4) times less” than the average (4) level of illumination.
22. *Watt* – The unit used to measure the electrical power used in the illumination of a light fixture.

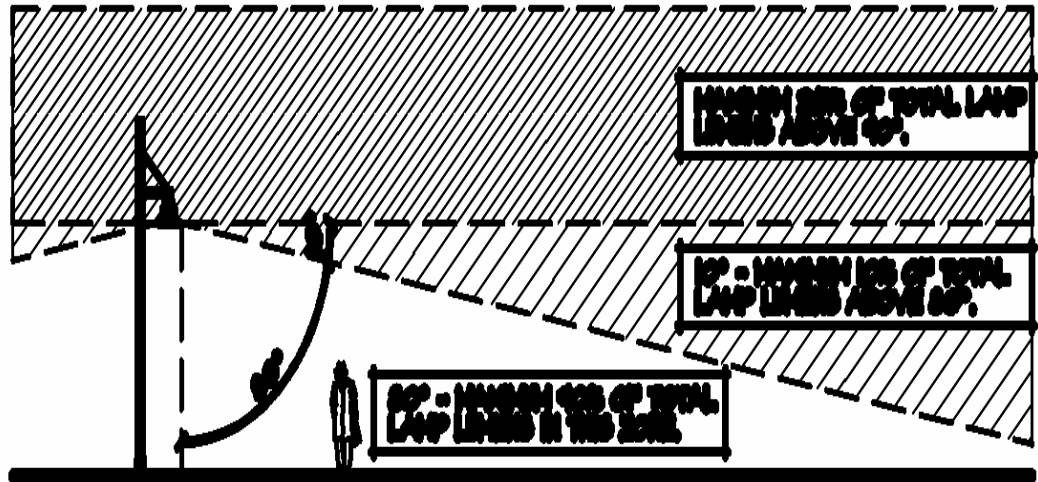
D. Approval Required

The Design Review Commission shall review and approve a lighting plan as part of an application for development plan approval. Approval of a lighting plan from the Design Review Commission is required prior to the issuance of a building permit, except for a grading permit and “foundation only” permit. All other outdoor lighting installations or replacements shall be approved by the Design Review Commission unless otherwise authorized by this section.

E. General Requirements (All Zoning Classifications)

1. Site lighting shall minimize light spill into the dark night sky.
2. Metal Halide fixtures shall be permitted. The use of metal halide light fixtures shall be encouraged, when not required, for outdoor illumination whenever its use would not be detrimental to the use of the property.
3. Wherever practicable, it is encouraged that lighting installations include timers, dimmers, and/or sensors to reduce overall energy consumption and unnecessary lighting. Uses that can turn off their outdoor lighting during night hours are to be encouraged in residential districts with those requiring all night illumination to be discouraged where appropriate.
4. Exterior lighting installations shall be designed to avoid harsh contrasts in lighting levels.
5. Outdoor floodlighting by flood light projection above the horizontal plane is prohibited.
6. All light fixtures including street lights, shall be located, aimed or shielded so as to minimize stray light trespassing across property boundaries.
7. Search lights, laser light sources, or any similar high-intensity light shall not be permitted, except in emergencies by emergency response personnel.
8. Outdoor light fixtures installed on single family attached and detached properties shall be positioned so that there are no significant direct light emissions onto adjacent residential properties or public rights-of-way.
9. Illumination for outdoor recreation facilities must conform to the shielding requirements of this Chapter, except when such shielding is determined to interfere with the intended activity. For such facilities, partially-shielded luminaires are permitted. Examples of activities where partially-shielded luminaires are permitted including, but are not limited to, baseball, softball, football, soccer and lacrosse. Specifically, tennis, volleyball, racquetball and handball courts and swimming pools must utilize fully-shielded luminaires.
10. Internal and external illumination of signs shall conform to the requirements of the Sign Ordinance.
11. Except as otherwise allowed for herein, exterior light fixtures on multi-family, office, commercial and industrial projects including planned developments which use the equivalent lumens per bulb of one hundred (100) watt or more incandescent bulbs shall conform with the Illuminating Engineer Society of North America (IESNA) criteria for full cutoff fixtures; that is, no significant amount of the fixture’s total output may be emitted above a vertical cutoff angle of ninety (90) degrees. Any structural part of the fixture providing this cutoff angle must be permanently affixed.

**Figure 10-1.
Example of Full Cut-off Fixture as Defined by IESNA.**



12. Lighting should meet the minimum IESNA standards in providing illumination and shall not exceed two hundred percent (200%) of the recommended values without specific written approval by the Design Review Commission. Site lighting shall be designed as part of the architecture and landscaping themes of the site. Lighting should provide for appropriate and desirable nighttime illumination for all uses on and related to the site to promote a safe environment for inhabitants.
13. Reference IESNA Recommended Practices RP-6 (Sports), RP-8 (Roadway), RP-20 (Parking Facilities) and RP-33 (Exterior Environment) for additional site lighting guidelines.
14. Fixtures and lighting systems used for safety and security shall be in good working order and shall be maintained in a manner that serves the original design intent of the system.
15. Glare and light trespass control shall be required to protect inhabitants from the consequences of stray light shining in inhabitant's eyes or onto neighboring properties. Light pollution control shall be required to minimize the negative effect of misdirected upward lighting.
16. Where feasible, additional landscaping may be required by the Design Review Commission to provide light screening between non-residential uses and residential districts to help prevent light spillage. Where landscaping is used for light screening, the Design Review Commission shall take into consideration the applicable landscaping standards found elsewhere in these regulations, the design standards found elsewhere in these regulations, the creation of excessive shadows or dark spaces, and views into and out of a site.
17. Vegetation and landscaping shall be maintained in a manner that does not obstruct security lighting and minimizes possible entrapment spaces.

18. To minimize the indiscriminate use of illumination, it is recommended that outdoor lighting, except as required for security, be extinguished during non-operating hours.
19. Upward lighting of building façades, monument signs up to six (6) feet tall, and outdoor artwork is permissible so long as the lighting is aimed directly at the object to be illuminated, not aimed into the sky, and light spillage is avoided. Signs mounted at a height greater than six (6) feet from the ground shall not use upward lighting.

F. Total Outdoor Light Output

The maximum total amount of light, measured in lumens, shall be calculated from all outdoor light fixtures. For lamp types that vary in their output as they age (such as metal halide), the initial output, as defined by the manufacturer, is the value to be considered. For determining compliance with this Chapter, the light emitted from outdoor light fixtures is to be included in the total output as follows:

1. Outdoor light fixtures installed on poles (such as parking lot luminaires) and light fixtures installed on the sides of buildings or other structures, when not shielded from above the structure itself as defined in subsections 2 and 3 below, are to be included in the total outdoor light output by simply adding the lumen outputs of the lamps used;
2. Outdoor light fixtures installed under canopies, building overhangs, or roof eaves where the center of the lamp or luminaire is located at least five (5) feet but less than ten (10) feet from the nearest edge of the canopy or overhang are to be included in the total outdoor light output as though they produced only one-quarter (1/4) of the lamp's rated lumen output;
3. Outdoor light fixtures located under the canopy and ten (10) or more feet from the nearest edge of a canopy, building overhang, or eave are to be included in the total outdoor light output as though they produced only one-tenth (1/10) of the lamp's rated lumen output.

G. Height

The mounting height of light fixtures shall be as follows:

1. The mounting height of a light fixture shall be measured from the center of the lamp to the finished grade immediately below the light fixture.
2. The height of wall-mounted light fixtures shall not exceed the height of the wall to which it is mounted and shall have the lamp source shielded from view to minimize glare.
3. The height of light fixtures should be in proportion to the building structure (e.g., single story building should provide pedestrian-scale lighting).
4. For multi-family residential, office, commercial, industrial, and mixed-use developments, exterior freestanding light fixtures shall be mounted using a full cut-off type light fixture as follows:
 - a. Light fixtures located within a Residential District shall not exceed fourteen (14) feet in height measured from finished grade.
 - b. Within fifty (50) feet of a residential zoned parcel – fourteen (14) foot maximum height of fixture measured from finished grade.

- c. Fifty-one (51) – one hundred fifty (150) feet from a residential zoned parcel – twenty (20) foot maximum height of fixture measured from finished grade.
 - d. One hundred fifty-one (151) feet or more from a residential zoned parcel – twenty-five (25) foot maximum measured from finished grade.
 - e. The use of a twenty-five (25) foot tall pole shall require pre-approval by the Design Review Commission prior to approval of overall site lighting plan.
- 5. For residential developments with fewer than twenty (20) dwelling units, exterior freestanding light fixtures shall be mounted no more than ten (10) feet high including base of post.
 - 6. Freestanding light fixtures installed along the right-of-way of Canada Road or Highway 70 shall be mounted no more than forty-five (45) feet high measured from finished grade of the centerline of the street.
 - 7. Freestanding light fixtures installed within public right-of-ways other than Canada Road and Highway 70 shall be mounted no more than thirty-five (35) feet high measured from finished grade of the centerline of the street.

H. Parking Lot Lighting

- 1. Parking lot lighting shall not exceed light levels necessary for safety and located vehicles at night. To achieve this and minimize light spillage onto adjacent properties, fixtures which cut off light at ninety (90) degrees or less from the vertical shall be used.
- 2. The lighting plan shall be designed so that the parking lot is lit from the outside perimeter inward, and/or incorporate design features with the intent of reducing off-site light pollution.
- 3. Illumination of parking areas shall be required for all parking areas with more than twenty (20) parking spaces.
- 4. The illumination may be provided through the use of light fixtures mounted upon poles.
- 5. The illumination of parking areas shall not be provided by building mounted light fixtures. Any building mounted fixtures shall be for aesthetic and security purposes only and shall be full cut-off style fixtures mounted near entryways.
- 6. Lighting shall be designed to provide for uniform lighting throughout the site with no dark patches or pockets.
- 7. No fixtures that shine outward and create a glare from a street right-of-way or residential property shall be permitted.
- 8. Lighting used to illuminate parking areas shall be arranged, located or screened to direct light away from any adjoining or abutting residential district or any street right-of-way. Light poles and fixtures shall meet the following criteria:
 - a. The style of light poles and fixtures should reflect the architectural character of the area and streetscape.
 - b. Maintain parking lot poles/fixtures of the same style, height, color and intensity of lighting throughout the development site. Varying styles of

fixtures may be permitted if it is demonstrated that the styles contribute to an overall theme for the area.

- c. *Light fixtures shall be nonadjustable, horizontally mounted fixtures, or fixtures with ninety (90) degrees or less luminaire cutoff. Fixtures that project light or glare toward a street right-of-way or neighboring property shall not be permitted.*

9. Illumination for parking areas shall be provided as follows:

- a. Average Maintained Footcandles: The maximum average maintained footcandles for all parking lots shall be three (3), unless otherwise approved by the Design Review Commission. For purposes of this Ordinance, the average maintained foot-candles shall be calculated at eight-tenths (0.8) of initial footcandles.
- b. Minimum Footcandles and Uniformity Ratio: The minimum amount of maintained illuminations for open parking shall be as provided in Table 10-1 below.

Table 10-1.

Minimum Footcandles and Uniformity Ratio (Max to Min)

<u>Uses</u>	<u>Footcandles</u>	<u>Uniformity Ratio</u>
Low Activity	0.5	25:1
Medium Activity	1.0	20:1
High Activity	2.0	15:1

For purposes of interpreting Table 10-1 above, the following rules shall apply: high activity uses shall include athletic events, major cultural or civic events, major regional shopping centers and similar uses; medium activity uses include fast food restaurants, financial institutions, community shopping centers (fifteen acres or more in land area), hospitals, residential complex parking and similar uses; low activity uses include local merchant parking (less than fifteen acre sites), industrial and office park parking, educational parking and similar uses.

- c. The maximum maintained vertical footcandle at an adjacent residential district shall be one half (0.5) footcandle measured five (5) feet above finished grade.
- d. The required illumination within a nonresidential development shall be measured at finished grade.

I. Minimum Perimeter Lighting Requirements

- 1. Lighting levels shall be based on initial lamp lumens and 1.0 maintenance factor.
- 2. For lighting levels adjacent to commercial property, the lighting shall not exceed one (1) foot-candle of illumination at the property line, and shall not exceed one-half (1/2) foot-candle ten (10) feet over the property line.

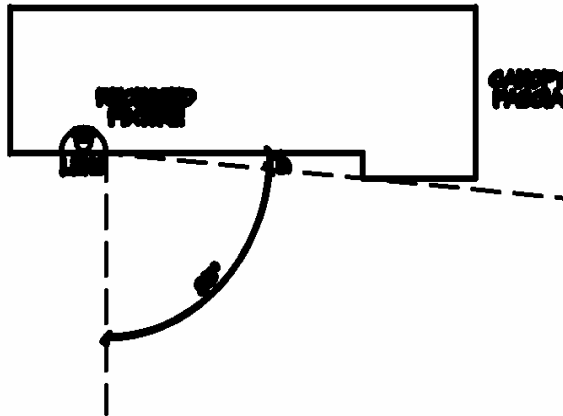
3. For lighting levels adjacent to residential zoned property, the lighting shall not exceed one-half (1/2) foot-candle of illumination at the property line and shall not exceed one-quarter (1/4) foot-candle 10 feet over the property line.

J. Canopy Lighting Standards

Lighting levels for canopies and aprons of commercial facilities shall be adequate only to facilitate the activities taking place in such location and shall not be used to attract attention to the business. It is recommended that the maximum level of illumination underneath the canopy not exceed ten (10) footcandles. The following standards shall be met:

1. Light fixtures mounted on canopies shall be recessed so that the lens cover is recessed or flush with the bottom surface (ceiling) of the canopy and/or shielded by the fixture or the edge of the canopy so that light is restrained to no more than eighty-five (85) degrees from vertical, as shown in Figure 10-2 below.

**Figure 10-2.
Example of Recessed Canopy Light Fixture Mount**



2. All luminaires mounted on the under surface of a canopy shall be fully shielded and utilize flat glass or flat plastic (acrylic or polycarbonate) covers.
3. The total light output used for illumination service station canopies, defined as the sum of all under-canopy initial bare-lamp outputs in lumens, shall not exceed twenty (20) lumens per square foot of canopy in the C-2, General Commercial District, and shall not exceed fifteen (15) lumens per square foot in the C-1, Neighborhood Commercial District. All lighting mounted under the canopy, including but not limited to luminaires mounted on the lower surface of the canopy and auxiliary lighting, is to be included toward the total permitted light output.
4. Lights shall not be mounted on the top or sides (fascias) of the canopy, and the sides (fascias) of the canopy shall not be illuminated in whole or part.
5. Canopies shall be constructed of non-light-emitting material.

K. Park and Common Space Lighting Requirements

Park and common open space lighting shall conform to the following requirements:

1. Light fixtures in municipal parks, pocket parks, common open spaces, and athletic fields shall employ full cutoff fixtures or fixtures designed to direct light downward.
2. Where it is established that there is a need for some up lighting, such as a baseball park, “sharp cutoff” fixtures, ones in which there is very good beam control of the light output, shall be used.
3. Lighting is discouraged on undeveloped open space and passive recreation areas. Any lighting installed on open space lands shall be pedestrian-scale with preference for bollard-style lighting.
4. Recreational Facility – No outdoor recreational facility, public or private, shall be illuminated by nonconforming means after 11:00 p.m. except to conclude any recreational or sporting event or other activity conducted at the facility in progress prior to 11:00 p.m.
5. Lighting for all recreational facilities shall be reviewed on a case by-case basis. New sports lighting systems shall be furnished with glare control. Lighting fixtures shall be mounted and aimed so that the illumination falls within the primary playing field and immediate surroundings so that no direct light illumination is directed off site.

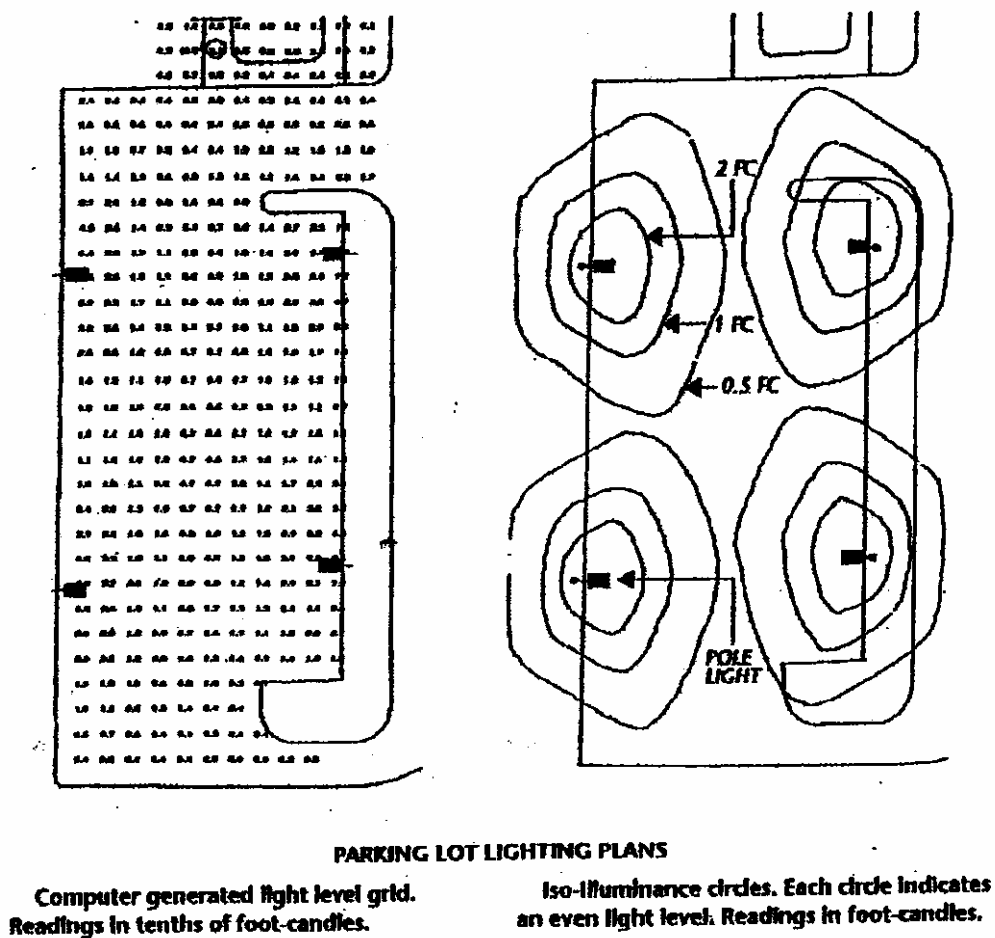
L. Lighting Plan Requirements

A lighting plan, prepared to the same scale as the site plan, shall be submitted for approval by the Design Review Commission. The lighting plan shall contain the following information:

1. A site plan drawn to scale showing all existing and proposed buildings, landscaping, parking and loading areas, driveways and pedestrian ways, and proposed exterior lighting fixtures.
2. Site plan depicting the location of all exterior light fixtures and a numerical grid of lighting levels (in footcandles) showing footcandle readings every twenty-five (25) feet within the property or site that the fixtures will produce on the ground (photometric analysis), and at ten (10) feet beyond the property lines at a scale specified on the site plan. An iso-footcandle contour line style plan is also acceptable. A report shall accompany the photometric plan that indicates the minimum, maximum and average foot-candle lighting levels, max-to-min ratio, and shall also indicate the light level at the property line.
3. Exterior light fixtures installed under canopies, building overhangs, or roof eaves where the center of the lamp or luminaire is located at least five (5) feet but less than ten (10) feet from the nearest edge of a canopy, building overhang, or roof eave are to be included in the total outdoor light output as though they produced only one-quarter (1/4) of the lamp’s rated lumen output.
4. Exterior light fixtures located under the canopy and ten (10) or more feet from the nearest edge of a canopy, building overhang, or roof eave are to be

- included in the total outdoor light output as though they produced only one-tenth (1/10) of the lamp's rated lumen output.
5. The calculation shall be measured at finished grade for light levels within the parking lot.
 6. Area of illumination.
 7. Indicate the means intended for on/off control of exterior lighting fixtures.
 8. Lamp type and wattage.
 9. Mounting height of all fixtures.
 10. A cut sheet of the proposed fixtures, including the candlepower calculation and an illustration depicting the design and finishes of all fixtures and designation as IESNA "cutoff" fixtures.
 11. Drawings of all relevant building elevations showing the location and aiming points of accent light fixtures.

Figure 10-3.
Examples of Photometric Plans



M. Prohibited Lighting

The following lighting is prohibited as follows:

1. Blinking and flashing lights.
2. Mercury Vapor lighting fixtures.
3. Exposed strip lighting used to illuminate building facades or outline buildings or architectural features unless otherwise authorized by the Design Review Commission.
4. Neon tubing except as allowed as a means of illumination for signage in accordance with the Sign Ordinance of the City of Lakeland.
5. Any light that may be confused with or construed as a traffic control device except as authorized by the Federal government, State of Tennessee, or City of Lakeland.
6. Beacons and search lights, except as used for rescue operations by the City of Lakeland and Shelby County.

N. Exemptions

Provided that no dangerous glare is created on adjacent streets or properties, the following lighting is exempt from the regulations of this section:

1. Holiday-style lighting;
2. Street lighting installed by MLGW upon authorization by the City of Lakeland for the benefit of public health, safety and welfare.

O. Mixed Use Developments

To allow the desired mixing and integration of uses, streetscapes, and innovative design treatments for mixed use or traditional neighborhood design developments, these design guidelines may be waived, so long as the development is a Planned Development, and so long as the development complies with all prior approvals of the City of Lakeland. All waived portions of the guidelines must be specifically identified in writing and approved by the Planning Commission, otherwise the applicable design guidelines of this chapter shall apply.